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| APPLICATION NO.   | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|----------------------|---------------------|------------------|
| 10/616,147  | 07/08/2003  | Klaus Kunze          | KOV-004             | 2078             |
| 36872   | 7590        | 09/08/2006           | EXAMINER            |                  |
| THE LAW OFFICES OF ANDREW D. FORTNEY, PH.D., P.C.<br>401 W FALLBROOK AVE STE 204<br>FRESNO, CA 93711-5835 |             |                      | TRINH, MICHAEL MANH |                  |
|   |             |                      | ART UNIT            | PAPER NUMBER     |
|   |             |                      | 2822                |                  |

DATE MAILED: 09/08/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/616,147

Applicant(s)

KUNZE ET AL.

Examiner

Michael Trinh

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 26 June 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-91 is/are pending in the application.
- 4a) Of the above claim(s) 1-40 and 66-91 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 41-65 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date See Continuation Sheet.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_.

Continuation of Attachment(s) 3). Information Disclosure Statement(s) (PTO/SB/08), Paper No(s)/Mail Date :7/8/03; 8/25/03; 11/18/03; 9/20/04; 6/16/06.

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## **DETAILED ACTION**

\*\*\* This office action is in response to Applicant's election filed June 26, 2006. Claims 41-65 are elected without traverse. Claims 1-95 are pending.

### ***Claim Objection***

1. The following claims are objected to because of the following informalities:

In claim 56, "said solvent" lacks proper antecedent basis.

In claim 57, "said solvent" and "said pattern" lack proper antecedent basis.

In claim 59, "said passivated..." lacks proper antecedent basis.

In claim 49, line 3, "said pattern" lacks antecedent basis.

In claim 62, "said pattern" lacks proper antecedent basis.

Appropriate correction is required.

### ***Election/Restrictions***

2. Claims 1-40,66-95 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, without traverse in Paper mail date June 26, 2006 of claims 41-65.

It is corrected that claims 1-95 are pending in this application instead of 1-91 as mentioned in the last office action, in which Group VI correctly includes claims 87-95 instead of claims 87-91.

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later

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invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 41-47,55-61 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shiho et al (2003/0045632) taken with Jacoson (6,294,401).

Shiho teaches (at paragraphs 38-93) a method for making a semiconductor film comprising at least the steps of: a) printing a composition comprising a first cyclic Group IVA compound of the formula  $\text{Si}_n\text{R}_m$ ,  $n$  is an integer of 3 or more and  $m$  is integer of  $2n+2$ , wherein  $\text{Si}_n\text{H}_{2n+2}$  is mentioned at paragraph 44, wherein dopants of B, P, and As with at least alkyl group are mentioned at paragraphs 76-82, which is corresponding to claimed formula (1):  $(\text{AH}_x)_n$ , where  $n$  is from 3 to 8 and each A in the formula is independently Si, and/or a second cyclic Group IVA compound of the formula (2):  $(\text{AH}_x)_m(\text{AH}_y\text{R}_z)_p(\text{ZR}')_q$ , (2) where  $(m+p+q)$  is from 3 to 12, each of the  $m$  instances of  $x$  is independently 0, 1 or 2, each of the  $p$  instances of  $y$  is independently 0, 1 or 2, each of the  $p$  instances of  $z$  is independently 0, 1 or 2, each of the  $p$  instances of  $(y+z)$  is independently 1 or 2, each of the  $q$  instances of  $w$  is independently 0 or 1, at least one of  $p$  and  $q$  is at least 1, each A in the formula (2) is independently Si, Z is selected from the group consisting of B, P and As,  $\text{R}'$  is R or H, and each R in the formula (2) is independently alkyl, aryl, aralkyl, a halogen,  $\text{BHsR}''2s$ ,  $\text{PHsR}''2-s$ ,  $\text{AsHR}''2-s$  or  $\text{AHtR}''.\text{sub.3-t}$ , where  $s$  is 0 to 2,  $t$  is 0 to 3, and  $\text{R}''$  is alkyl, aryl, aralkyl, a halogen, or  $\text{AH}_3$ , in a film on a substrate; and b) curing said composition to form said semiconductor film (paragraphs 117,120,137,138). Re claims 42-44, wherein the composition comprises semiconductor silicon nanoparticles (paragraphs 60-64) and passivated as the silicon particles are dispersed in the silane composition. Re claim 45, wherein the composition including both first and second cyclic group IVA compound of silicon and dopants of B, P, As (at paragraphs 38-93), herein  $\text{Si}_n\text{H}_{2n+2}$  is mentioned at paragraph 44, wherein dopants of B, P, and As with at least alkyl group are mentioned at paragraphs 76-82. Re claims 46,58 wherein curing by heating so as to sintering the semiconductor film so as to dry the semiconductor film (paragraphs 117,120,137-138). Re claim 47, wherein curing comprises irradiating the composition (paragraphs 120,138). Re claims 58-59, wherein curing by heating so as to sintering the semiconductor film so as to dry the semiconductor film at a temperature at least about  $200^\circ\text{C}$  (paragraphs 117,120,137-138). Re

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claims 60-61, wherein the curing heat treatment is evacuated so as to treat in an inert argon gas or reducing hydrogen gas in chamber, inherently (paragraphs 117, 137).

Re claim 41, Shiho lacks forming the semiconductor film as a patterned semiconductor film by screen printing (re claims 57,56,55).

However, Jacobson teaches (at col 5, lines 34-60; col 3, lines 36-43) printing semiconductor nanoparticles to form a patterned semiconductor film on a substrate by using any of variety including spin coating, casting, screen printing, stamping, etc, wherein the patterned semiconductor film is used in forming a thin film transistor, wherein printing by ink jetting the composition with solvent (re further claim 56, col 5, lines 34-45, col 6, lines 1-10; col 4, lines 13-15), wherein by screen printing process, the composition with solvent is inherently deposited on the substrate through stencil on or over the substrate (re claim 55), wherein the printing of the composition with solvent includes screen printing, gravure printing, lithography (re claim 57).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to form the semiconductor film of Shiho as a patterned semiconductor film by printing, stamping, screen printing, spin coating, etc., as taught by Jacobson above. This is because of the desirability to form patterned semiconductor films on desired and selected portions of the substrate in forming a plurality of semiconductor thin film transistors by using a variety of printing processes.

5. Claims 48-50, 62-65 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shiho et al (2003/0045632) and Jacobson (6,294,401), as applied to claims 41-47,60-61, and further of Bulthaup et al (6,936,181).

Shiho and Jacobson teach a method for making a semiconductor film as applied to claims 41-47,55-61 above. Jacobson teaches (at col 5, lines 34-60; col 3, lines 36-43) printing a composition of semiconductor nanoparticles to form a patterned semiconductor film on a substrate by using any of variety including spin coating, casting, screen printing, stamping, wherein the printing of the composition with solvent includes screen printing, gravure printing, lithography. Shiho also teaches (at paragraph 110) depositing the composition by spray coating, spin coating, re further claim 65, wherein the composition layer has a thickness of up to 10 microns (paragraph 110).

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Shiho thus lacks depositing and embossing a layer of composition (claim 48).

However, Bulthaup teaches (at Figs 1A-1B,2-7; col 4, line 13 through col 6) depositing a layer and embossing the layer to form a plurality of patterned films on a plurality of first and second fields on the substrate, wherein the patterned film over a first field is having a width that is different and distinct from other patterned films (Figs 2a,1d).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to pattern the semiconductor film of the references including Shiho and Jacobson by depositing a layer of composition and embossing as taught by Bulthaup. This is because these patterning techniques are alternative and art recognized equivalent for substitution in forming distinct patterned semiconductor films on the substrate so as a plurality of semiconductor thin film transistors can be fabricated at the same time. The subject matter as a whole would have been also obvious to one of ordinary skill in the art at the time the invention was made to select the portion of the prior art's range of thickness of up to 10 microns, as taught by Shiho at paragraph 110, and determine appropriate width and length of the patterned films as shown by Jacobson and Bulthaup, because it has been held to be obvious to select a value in a known range by optimization for the best results, and would be an unpatentable modification, where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation". *In Re Aller* 104 USPQ 233,255 (CCPA 1955); *In re Waite* 77 USPQ 586 (CCPA 1948).

6. Claims 51-54 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shiho et al (2003/0045632) and Jacobson (6,294,401), as applied to claims 41-47,60-61, and further of Tani et al (5,254,439).

Shiho and Jacobson teach a method for making a semiconductor film as applied to claims 41-47,55-61 above. Jacobson teaches (at col 5, lines 34-60; col 3, lines 36-43) printing a composition of semiconductor nanoparticles to form a patterned semiconductor film on a substrate by using any of variety including spin coating, casting, screen printing, stamping, wherein the printing of the composition with solvent includes screen printing, gravure printing, lithography. Shiho also teaches (at paragraph 110) depositing the composition by spray coating, spin coating, and irradiating the composition with an ultraviolet light (paragraph 138).

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Shiho thus lacks selectively irradiating the composition through a mask (claims 51-54)

However, Tani teaches (at Figs 2,3; col 5, line 60 through col 6) selectively irradiating the layer through a mask aligned on substrate as marked, and removing a portion of the layer after irradiating in order to form a plurality of patterned layers.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to pattern the semiconductor film of the references including Shiho and Jacobson by selectively irradiating through a mask and removing a portion of the layer as taught by Tani. This is because these patterning techniques are alternative and art recognized equivalent for substitution in forming distinct patterned semiconductor films on the substrate so as a plurality of semiconductor thin film transistors can be fabricated at the same time.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael M. Trinh whose telephone number is (571) 272-1847. The examiner can normally be reached on M-F: 9:00 Am to 5:30 Pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Zandra Smith can be reached on (571) 272-2429. The central fax phone number is (703) 872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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Michael Trinh  
Primary Examiner